BIPOLAR ELECTROLYZER

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In the original bipolar electrolyzers of the filter-press type, the gas and electrolyte channels were located in the electrode plates constituting the separation plates of the cells. Later designs placed the channels outside of the actual cell unit where the channel rings were rigidly connected to the diaphragm frame and assembled under pressure to the actual cell unit. This design is an adaptation of the original arrangemment shown in fig. 1 and has both the advantage of greater simplicity but also certain serious structural and operational disadvantages.

The adjustment of accurate length of the channels and of the cell unit offers certain difficulties because the two parts do not have the same number of individual components. Small differences in the thickness of the separation plates and the gaskets resulted, in view of the large number of individual parts, in rather considerable differences of length and produced in turn uneven pressure. Failure of gaskets and damage through corrosion and consequent leakage in the channels makes it necessary to disassemble the entire

unit in order to repair a defective channel. Moreover, it is not possible to tighten a leaking channel individually, since the assembled unit cannot be correspondingly tightened as a whole.

According to the invention herein, these deficiencies are avoided in a bipolar electrolyzer of the filter-press type by pressing the longitudinal connecting channel, consisting of metal rings and interposed insulating rings and located outside of the cell unit, together independently of the latter.

One example of such a method of construction is shown in fig. 3 of the attached drawing, in which fig. 1 and 2 represent presently customary construction designs. In all of the figures, 1 identifies the separation plates, 2 the diaphragm frames, 3 the cell gaskets, 4 the gas channels, 5 the electrolyte channels, 6 the channel gaskets, 7 the joint pressure bolts, and 8 the end plates. In fig. 3, the gas channels are pressed together by the pressure bolts 9 and the end plates 10, whereas the electrolyte channel 5 is provided with the pressure bolts 11 and endplates 12. In contrast to fig. 2 where the tubes 13 are soldered to the diaphragm frame, they are constructed adjustably and preferably also flexibly. The tube connections can be provided in a known manner as flexible tubing or articulated joints. It is also possible to employ pipe bends, preferably of 80° to 180°, with flange connections, for which the necessary flexibility and adjustability is provided by the insertion of gaskets of sufficient thickness.

The pressure bolts for the channels can be held in the endplates of the cell unit or the channels can be provided with their own pressure bolts. This last arrangement mkes it possible to assemble ~~the channels~~ and press the channels together separately and to install them on the cell block subsequently and is an arran-

gement which has considerable advantages in construction and operation.

Principal Claim

Bipolar electrolyzer of the filter-press type in which at least one longitudinal connectiong channel, consisting of metal rings and interposed insulating rings, is arranged outside of the cell unit and characterized by the fact that the pressure for the longitudinal connecting channel is arranged independently from the pressure of the cell unit.

Dependent Claims

1. Bipolar electrolyzer according to principal claim characterized by the fact the connecting tubes between the individual metal rings of the longitudinal connecting channel and the respective cells are adjustable.

2. Bipolar electrolyzer according to dependent claim 1 characterized by the fact that the tubes are also flexible.

3. Bipolar electrolyzer according to principal claim characterized by the fact that, where several longitudinal channels exist, each channel is pressed together separately.

4. Bipolar electrolyzer according to the principal claim characterized by the fact that longitudinal channels are assembled independently of the cell unit and are connected to the cell unit.

Maschinenfabrik Oerlikon.

Encl. 1 sheet of drawings
(3 figs.)

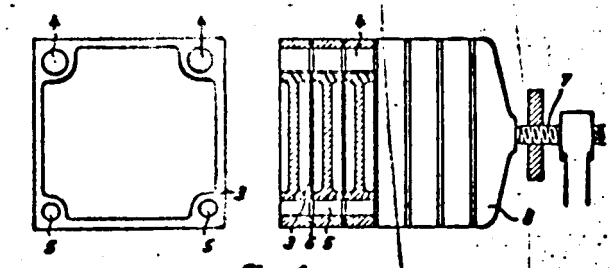

Fig. 1

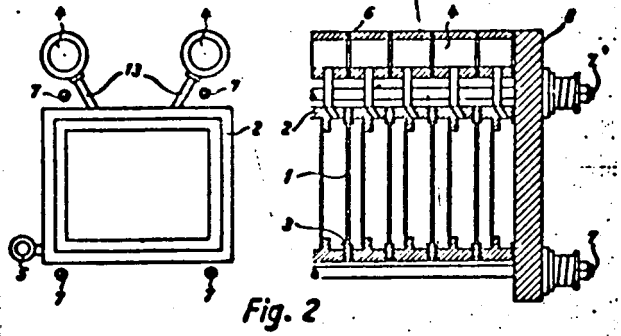

Fig. 2

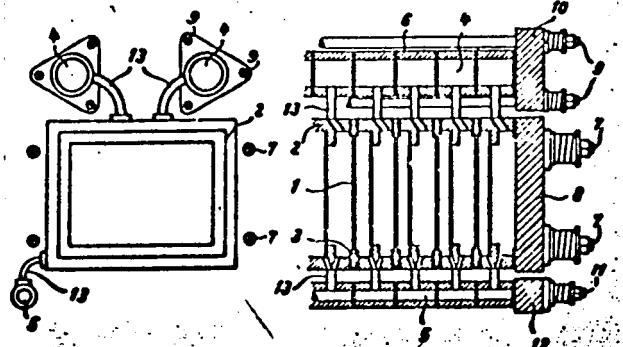

Fig. 3